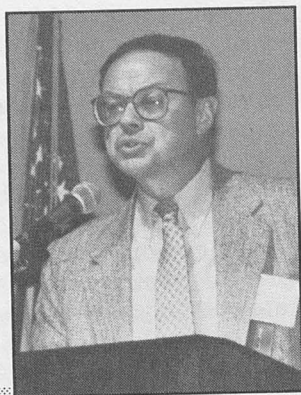


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GENERAL SESSION
Friday, September 6, 1991

Dr. Tom Leinbach
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**ADVANCED INSTITUTE FOR TRANSPORTATION
SYSTEMS MANAGEMENT**

Nearly 100 years ago an economist, Charles Cooley, wrote a paper with the grandiose title, *The Theory of Transportation*. In that paper, Cooley essentially points out the very broad set of conditions which transportation impacts and which, in turn, is affected by transportation.

Too often, we view transportation solely within our own disciplines. We forget that transportation does indeed have (in addition to a physical or engineering component) economic, political, social, and spatial or geographical components as well. Cooley's theory suggests that transportation touches many spheres of influence simultaneously.

To extend these ideas, we must recognize that we are in an era of a global economy where simultaneous actions in distant places are soon interrelated. This is, in part, because improved transportation and technology have acted to "shrink" our globe. Moreover, changes in transportation technology have interacted with changes in product and process technologies to effect a complex production process. The application of technology to the transportation sector has essentially created an even greater demand for capable and imaginative transportation professionals.

Need for Transportation Professionals

A recent report by the Transportation Research Board indicates that we are in the midst of a decade in which there will be a high turnover of senior professionals in transportation agencies across the United States.

Significant personnel deficiencies will be created in state, local, and municipal highway agencies, transit agencies, and the federal government.

Coupled with this, the growth of personnel trained in transportation, especially in civil engineering, is not strong. The National Science Foundation estimates that by 1996 the number of science and engineering graduates will fall substantially short of the demand.

At the same time, the availability of new technology has created a set of different opportunities in the private sector for transportation professionals. All of this has important implications for our own competitiveness in the global economy.

The nation's universities will continue to be the key supplier of new professionals to the transportation industry. Continued high quality, current- and forward-thinking programs are essential to ensure that tomorrow's transportation professionals are ready to do tomorrow's jobs.

Thus, the universities must revise transportation curricula to include not only technical specialties but stronger communication and analytical skills, strategic thinking, impact assessment and political awareness, entrepreneurship and group dynamics, all of which emphasize a global perspective.

In addition, we must reach out and publicize opportunities in transportation in an attempt to influence career choices. At the same time, we are obligated to develop programs that will encourage women and minorities to enter the transportation profession.

Finally, we need to preserve and develop strong university research programs that advance the state-of-the-art and also play a vital role in educating future professionals in transportation.

With this background, I'd like to talk briefly about what I feel is a unique and innovative transportation program that is now in its second year at UK.

In 1987, Congress authorized the University Transportation Centers (UTC) Program. The purpose of this legislation was to allow the establishment and operation of transportation centers in each of the 10 federal

regions. The Centers, selected by USDOT, are to conduct multi-modal research and training that is focussed on the transportation of people and goods.

The centers have, in fact, become focal points for addressing transportation issues; attracting talent, resources, and facilities; and for promoting individual initiatives and scientific innovation in transportation.

Essentially, the UTCs are serving an important role in training tomorrow's transportation professionals by attracting students and faculty interest in multi-modal transportation problem-solving.

In 1990, additional emphasis was placed on developing educational capability for the transportation field. As a result of this emphasis, a competition was set up to establish advanced institutes that are to focus on preparing the transportation professionals of the future.

As a result of the competition, two universities in the Southeastern Consortium were selected to establish institutes in the fall of 1990. These were UK and Vanderbilt University. Beginning in the 1990-91 academic year, UK established a post-baccalaureate program in transportation systems. At the conclusion of the one-year program, a certificate is awarded to each student by the Graduate School.

The original proposal for the UK Advanced Institute was developed by Professor Jack Deacon of the Department of Civil Engineering and Don Hartman of the Transportation Center with the encouragement of the dean of the Graduate School.

The academic coordinator oversees academic aspects of the program and serves as an advisor to the enrolled students. Professor Vince Drnevich of the College of Engineering was the program's first academic coordinator and I am the current coordinator.

The intent is to rotate this responsibility among the participating disciplines in the program. The disciplines currently participating in the program are:

1. **CIVIL ENGINEERING**—with a long-established record of involvement in, for example, planning, construction, safety, and technical aspects of transportation.
2. **BUSINESS ADMINISTRATION**—focussed on regulation, management, and financial aspects of the transportation sector, and

3. **GEOGRAPHY**—a discipline concerned with the locational aspects of transportation, such as the analysis of commuter and freight flows, as well as the impact of transportation on places and their economic development. The role of I-75 and its impact upon the state's economy and population is also an example. Recent research in geography, to use another example, also has focussed upon the impact of deregulation and 'hubbing' on the route patterns and operations of the domestic airline industry.

Transportation Systems Management Program

The Transportation Systems Management Program, funded by USDOT, is basically designed to educate advanced transportation professionals. It is now structured as a one-year, post-baccalaureate program with three basic objectives:

1. to encourage interest in the field of transportation,
2. to allow students to develop a systems perspective (in other words, to see the way in which inputs—such as information, decisions, materials, and funds, for example—link to and are woven together to produce a variety of outputs and effects), and
3. finally, we wish to emphasize an interdisciplinary approach to show that transportation is not exclusively the domain of economics, engineering, business, public administration, or geography, but rather involves all of these disciplines.

Post Baccalaureate Program

The Transportation Systems Management Program is designed especially to:

1. complement traditional degree programs so that a student also is actually a formal candidate for an advanced degree in a specific disciplinary program,
2. to provide experiential education in systems management by allowing students to work directly in the transportation field,
3. to provide an opportunity for interdisciplinary interaction by exposure to alternative views and ideas of economists, managers, engineers, and geographers,
4. to ensure extracurricular professional involvement which is accomplished by attendance at professional meetings and visits to transportation agencies, and
5. to stress the development of communication/leadership and teamwork skills.

Content of Program

The Transportation Systems Management Program provides unique core courses and other activities that we feel are appropriate to the development of a transportation professional. These are:

1. a one week fall orientation session which includes an introduction to the program, the Kentucky State Transportation Cabinet, and the Kentucky Transportation Center. In addition, a trip to the Atlanta area includes a roundtable meeting with the region's federal modal administrators, and a visit to the Mass Transit Authority and Delta Airlines.
2. Two core courses that deal with:
 - a. *management of the transportation enterprise* that includes, among other things, the involvement of students in an interactive computer simulation of managing a regional airline, and
 - b. *transportation growth and mobility* that emphasizes conceptual aspects of transportation such as the systems approach along with discussions of problems, trends, and issues within the transportation sector at local, national, and international levels. Among the many topics raised are the matters of deregulation and its impact, the effect and prospects for privatization in the developing world, decisions surrounding the need to expand airport facilities and networks.

Students in this course are required to complete a conceptual treatise or issues paper which deals with some aspect of the transportation sector.

3. Students also attend transportation leadership seminars. The objective here is to have leaders or executives bring their knowledge and views on transportation to the UK campus. In this, students come to appreciate real-world transportation experiences and challenges. For example, last year we were privileged to have the CEO of CSX Corporation visit the program and discuss his experiences with our students.
4. A major feature of the Transportation Systems Program is a 2-month summer management internship program. Internships are arranged matching a student's interest with a transportation firm or agency. The placements include American Engineering, ATE Management Services (in Cincinnati), Louisville Airport, National Highway Institute, Transportation Research Board, and United Parcel Services. These internships by all indications have been immensely successful and worthwhile for both the students and employers. In fact, several

students have already been offered employment. but we insist they finish their respective programs first!

In addition to these basic components of the program, students also are required to attend the annual meetings of the Transportation Research Board in Washington. These meetings offer papers on the widest variety of topics related to transportation. Increasingly, students will be encouraged to present papers as well as attend sessions.

In this vein, there is also a student symposium which brings together students from universities in the Southeast Region and is usually held in conjunction with a regional transportation meeting.

Eight students are currently enrolled in this year's institute and we expect that they will have the same challenging experiences which our first group had.

The program has received a wide range of private and public sector interest and has been acknowledged as one of the most unique transportation programs in the United States by a visiting DOT site team. Students develop a high sense of interdisciplinary appreciation and camaraderie.

We firmly believe that this program will make a significant contribution by providing the new kind of professionals that must meet the transportation challenges of the twenty-first century.